

ANSWERS TO QUESTIONS PHYSICAL SETTING: PHYSICS STARREVIEW

Updated 07/21/04

CHAPTER 1 PHYSICS FOR NEXT GENERATION

KEY IDEA 5

PERFORMANCE INDICATOR 5.3

Try It: Skill M 1.1, Pg 013

- 1 1.1×10^{-27} kg
- 2 13034 MeV or $2.09 \times 10^{-9} \text{ J}$
- 3 $6.3 \times 10^{18} \text{ J}$
- 4 $1.1 \times 10^{-12} \text{ kg}$
- 5 5.13 MeV

Try It: Pg 018

- 6 The energy imparted produces mesons before the quark is isolated.

Try It: Skill 3.2, Pg 019

- 7 $6.5 \times 10^{-7} \text{ m}$ and $6.5 \times 10^{-5} \text{ cm}$
- 8 $3.0 \times 10^{10} \text{ cm/s}$ and $3.0 \times 10^5 \text{ km/s}$
- 9a $1.0 \times 10^{-10} \text{ m}$
- 9b $0.1 \times 10^{-6} \text{ mm}$
- 9c $0.1 \times 10^{-3} \text{ }\mu\text{m}$

Try It: Skill 3.2, Pg 021

- 10 $6.5 \times 10^{-1} \text{ m}$
- 11 $2,300 \times 10^{12} \text{ watts}$
- 12 $4.73 \times 10^{-2} \text{ m}$
- 13 $1.45 \times 10^{14} \text{ volts}$
- 14 $1.55 \times 10^{-9} \text{ m}$

Try It: Pg 022

- 15 10^3 jelly beans
- 16 10^5 kg
- 17 10^2 golf balls
- 18 10^3 gallons/year
- 19 10^5 m
- 20 10^4 hairs
- 21 10^{12} kg
- 22 10^6 balloons
- 23 10^3 hot dogs
- 24 10^3 pizzas

Try It: Skill M 2.1, Pg 024

- 25 Determining the size of the atom
- 26 Increasing the number of drops, and averaging the results.

CHAPTER 1 ASSESSMENTS PART A - Questions, Pg 025

- 1 3
- 2 2
- 3 3
- 4 1
- 5 1
- 6 2
- 7 3
- 8 1
- 9 2
- 10 4
- 11 3
- 12 1
- 13 3
- 14 4
- 15 3
- 16 3
- 17 3
- 18 3

PART B - Questions, Pg 027

- 19 3
- 20 4
- 21 2
- 22 2
- 23 1
- 24 3
- 25 4
- 26 c^2
- 27 quark and anti-quark
- 28 up, up, down
- 29 0 quarks
- 30 three
- 31a gravitly
- 31b weak nuclear
- 31c electromagnetic
- 31d strong
- 32 nuclear, weak
- 33 $1.66 \times 10^{-27} \text{ kg}$

PART C - Questions, Pg 028

- 34 $E = mc^2$
 $E_p = (1.67 \times 10^{-27} \text{ kg})(3.0 \times 10^8 \text{ m/s})^2$
 $= 1.503 \times 10^{-10} \text{ J}$
 $E_e = mc^2$
 $E_e = (9.11 \times 10^{-31} \text{ kg})(3.0 \times 10^8 \text{ m/s})^2$
 $= 8.2 \times 10^{-14} \text{ J}$

The proton would yield $1.502 \times 10^{-10} \text{ J}$ more energy than an electron.

- 35 $E = mc^2$
 $E = (1.67 \times 10^{-27} \text{ kg})(3 \times 10^8 \text{ m/s})^2$
 $E = 1.503 \times 10^{-10} \text{ J}$
 $E = 1.503 \times 10^{-10} \text{ J}$ (1 MeV/1.6 $\times 10^{-13}$ J)
 $= 938.9 \text{ MeV} = 9.39 \times 10^2 \text{ MeV}$

CHAPTER 2 VECTORS

KEY IDEA 5

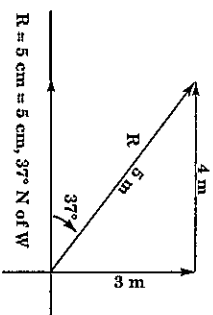
PERFORMANCE INDICATOR 5.1

Try It: Skill M 1.1, Pg 031

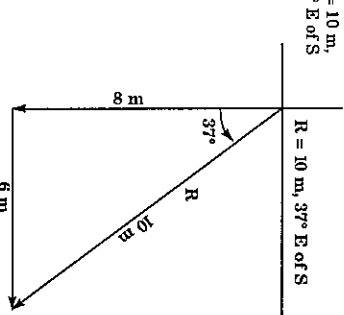
$$1 \quad 10 \left(\frac{\text{m}}{\text{s}} \right) \left(\frac{3600 \text{ s}}{1 \text{ h}} \right) \left(\frac{1 \text{ ft}}{0.305 \text{ m}} \right) \left(\frac{1 \text{ mi}}{5280 \text{ ft}} \right) = 22.4 \text{ mi/hr}$$

Try It: Skill 5.1 IV, Pg 033

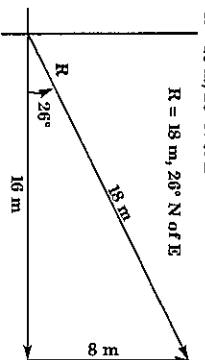
- 2a $R = 5 \text{ cm} = 5 \text{ m}, 37^\circ \text{ N of W}$



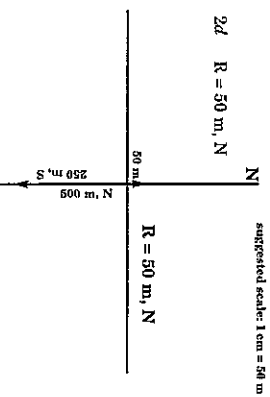
- 2b $R = 10 \text{ m}, 37^\circ \text{ E of S}$



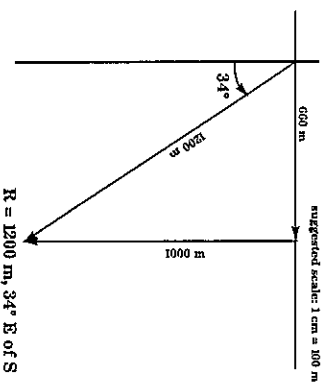
- 2c $R = 18 \text{ m}, 26^\circ \text{ N of E}$



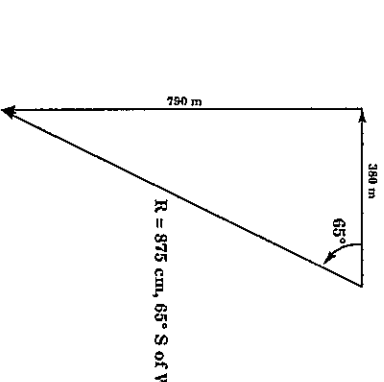
- 2d $R = 50 \text{ m}, \text{N}$



- 2e $R = 1200 \text{ m}, 34^\circ \text{ E of S}$



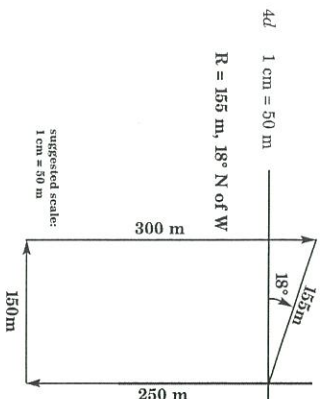
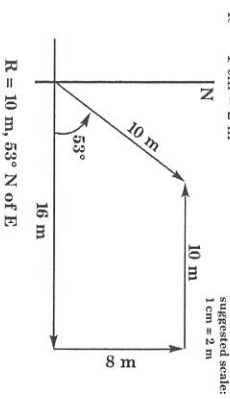
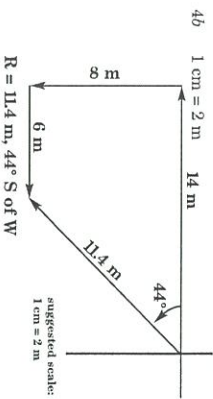
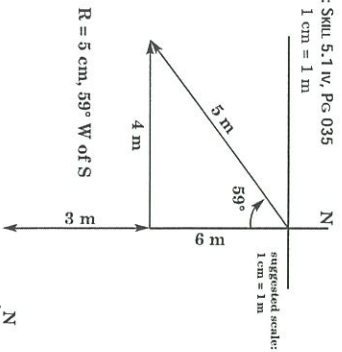
- 2f $R = 875 \text{ cm}, 65^\circ \text{ S of W}$



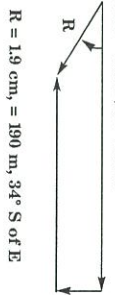
Try It: Skill 5.1, M 1.1, Pg 034

- 3a $5 \text{ m} @ 37^\circ \text{ N of W}$
- 3b $10 \text{ m} @ 37^\circ \text{ E of S}$
- 3c $17.9 \text{ m} @ 26.6^\circ \text{ N of E}$
- 3d $50 \text{ m}, \text{N}$
- 3e $1198 \text{ m} @ 56.6^\circ \text{ S of E}$
- 3f $877 \text{ cm} @ 64^\circ \text{ S of W}$

Try It: Skill 5.1 iv, Pg 035
4a 1 cm = 1 m



4e scale 1 cm = 100 m
R = 1.9 cm = 190 m, 34° S of E



Velocity (m/s)	Angle degrees	x-components (m/s)	y-components (m/s)
100	10	98.5 m/s	17.4 m/s
100	30	86.6 m/s	50.0 m/s
100	45	70.7 m/s	70.7 m/s
100	60	50.0 m/s	86.7 m/s
100	90	0.00 m/s	100 m/s

Try It: Skill M 1.1 & M 3.1, Pg 037

Try It: Skill 5.1 iv, M 3.1, Pg 039
6 67.4 m @ 67° S of E
7a 362.8 m @ 49.5° N of E
7b 398.8 m @ 5.4° W of N
8 One satellite will provide your distance from the satellite, two signals will give you two possible locations, the third is needed to narrow it down to a single location.

CHAPTER 2 ASSESSMENTS

Part A - Questions, Pg 043

1	2	8	4
2	1	9	3
3	4	10	2
4	2	11	1
5	1	12	1
6	3	13	4
7	1	14	1

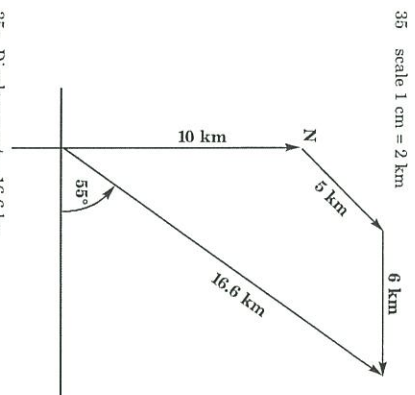
Part B - Questions, Pg 044

15 4
16 3
17 1
18 4
19 4
20 2
21 14.4 km
22a 50 N
22b 86.6 N
23 13.2 m
24 800 m
25a 192.8 N
25b 229.8 N
26 Displacement occurs in straight line motion, distance does not have to, and therefore is greater than the displacement.

27 4 blocks, west
28 30 m, north
29 4 km
30 2 blocks, east
31 50 N
32 500 km
33 S N

Part C - Questions, Pg 048

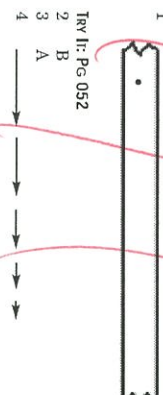
34 $\sin \theta = \frac{F_{\text{opp}}}{R}$ (or F_{vertical})
 $F_{\text{opp}} = F \sin \theta$
 $= 100 \text{ N} \sin 60^\circ$
 $= 86.6 \text{ N}$
 $\cos \theta = \frac{F_{\text{horizontal}}}{F}$
 $F_{\text{horiz}} = F \cos \theta$
 $= 100 \text{ N} \cos 60^\circ$
 $= 50.0 \text{ N}$



35a Displacement = 16.6 km
35b Distance = 10 km + 5 km + 6 km = 21 km

CHAPTER 3 KINEMATICS

KEY IDEA 5
PERFORMANCE INDICATOR 5.1



Try It: Skill 5.1, 5.1iv, Pg 055
5 graph 1: $m = 4.17 \text{ m/s}$

6 graph 2: $m = 0.1 \text{ m/s}$

Try It: Skill M 3.1, 5.1v, Pg 056
[Note: Graphs below are of a general shape.]

